

Figure 1: A block diagram of one preferred system architecture

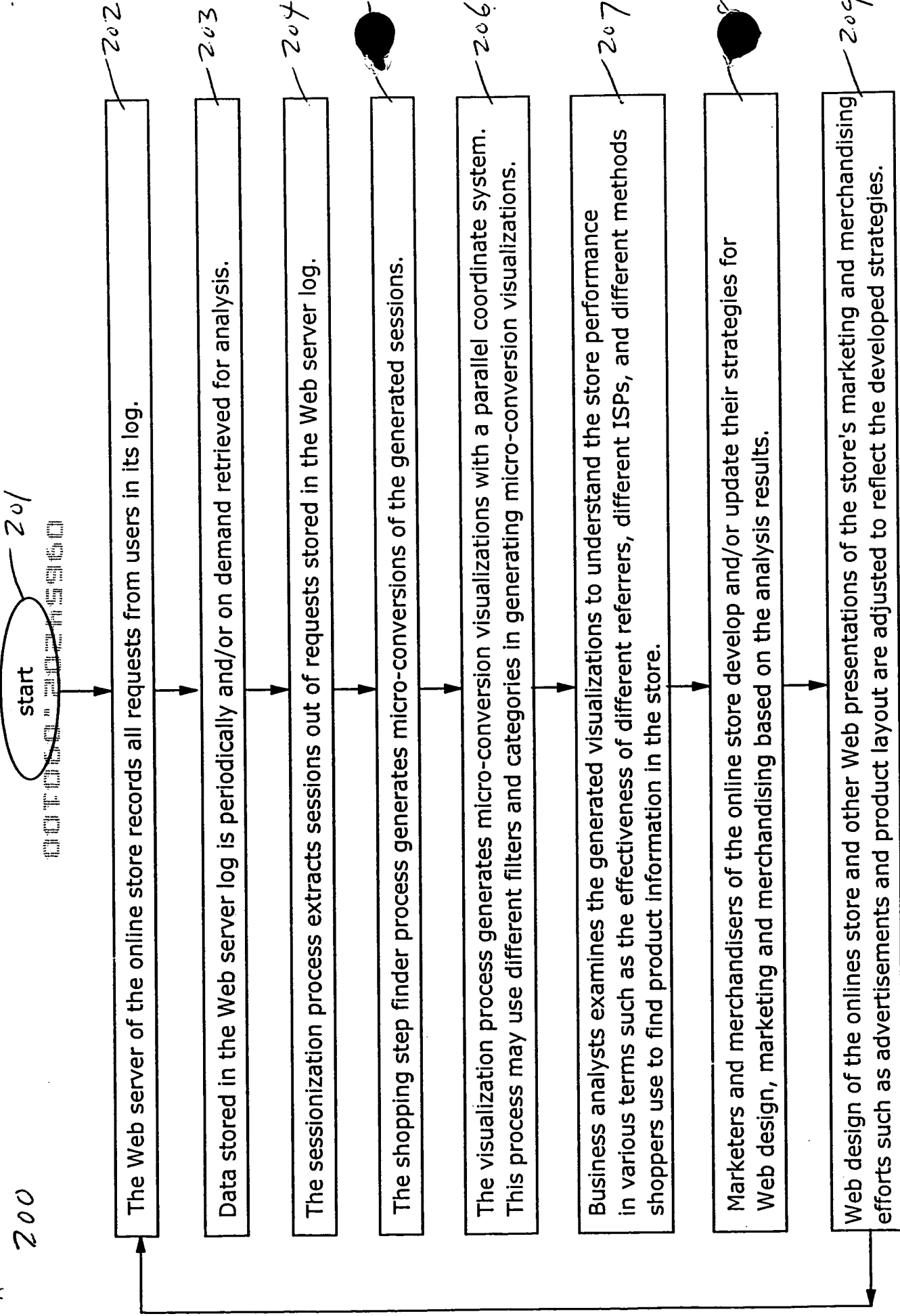
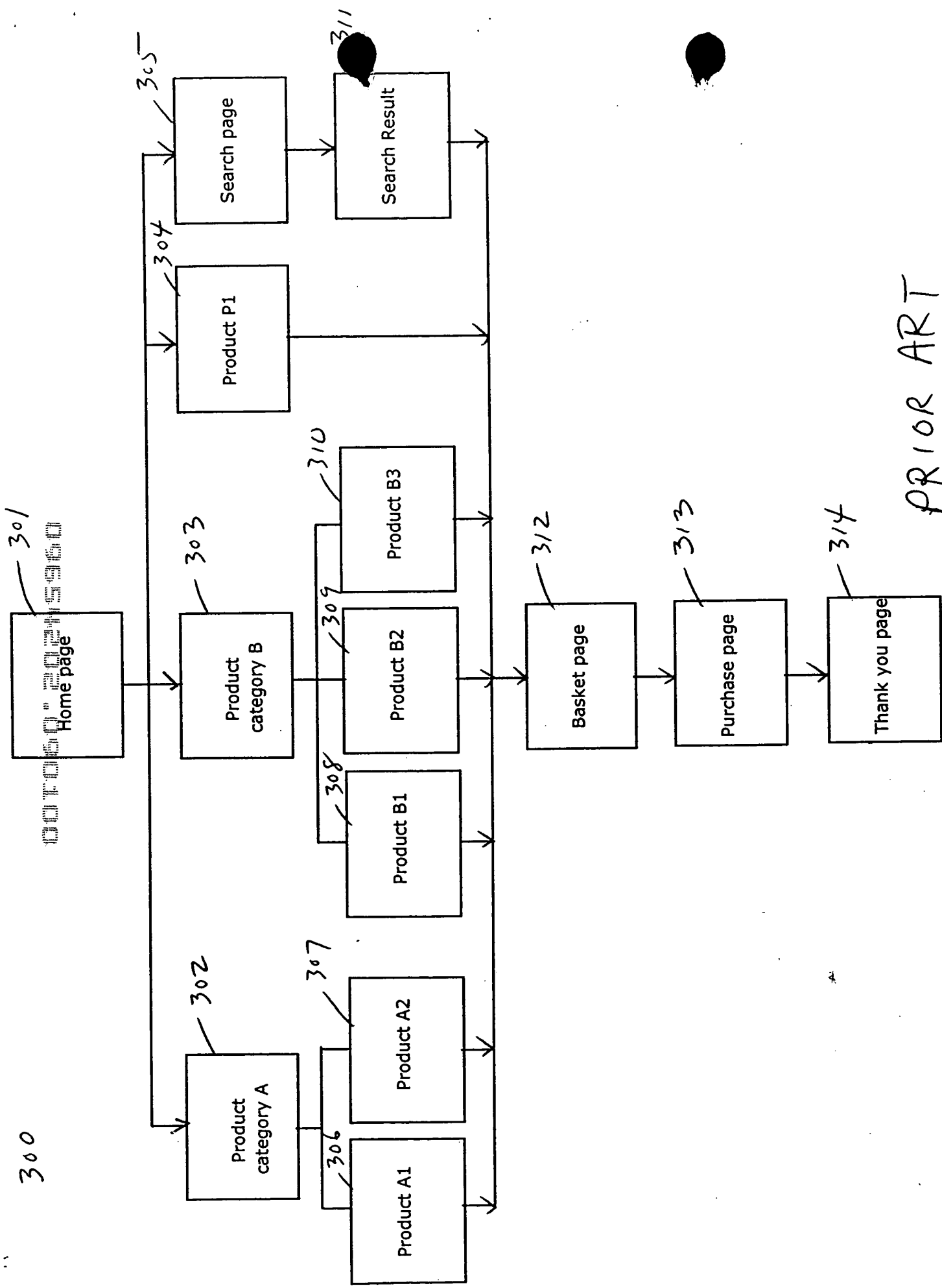


Figure 2: A flow chart of a preferred business process



PRIOR ART

Figure 3: An example of an online store structure

400
 401
 402
 403
 405
 404
 406
 407
 408
 409
 410
 411
 412
 413
 414
 415
 416
 417
 418
 419
 420
 421
 422
 423
 424
 425
 426
 427
 428
 429
 430
 431
 432
 433
 434
 435
 436
 437
 438
 439
 440
 441
 442
 443
 444
 445
 446
 447
 448
 449
 450
 451
 452
 453
 454
 455
 456
 457
 458
 459
 460
 461
 462
 463
 464
 465
 466
 467
 468
 469
 470
 471
 472
 473
 474
 475
 476
 477
 478
 479
 480
 481
 482
 483
 484
 485
 486
 487
 488
 489
 490
 491
 492
 493
 494
 495
 496
 497
 498
 499
 500

Timestamp	Session ID	Referrer	Current Page	Links
T1	S1	R1	Home	A, B, P1, Search
T2	S2	R2	Home	A, B, P1, Search
T3	S1	Home	A	A1, A2
T4	S3	R3	Home	A, B, P1, Search
T5	S2	Home	Search	
T6	S1	A	A1	Basket, A
T7	S3	Home	P1	Basket
T8	S1	A1	Basket	Purchase, Home
T9	S2	Search	Search Result	A2, B1, B2
T10	S1	Basket	Home	A, B, P1, Search
T11	S2	Search Result	B1	Basket, B
T12	S1	Home	B	B1, B2, B3
T13	S1	B	B2	Basket, B
T14	S1	B2	B	B1, B2, B3
T15	S2	B1	Basket	Purchase, Home
T16	S1	B	B3	Basket, B
T17	S2	Basket	Purchase	Thank You
T18	S3	P1	Home	A, B, P1, Search
T19	S1	B3	Basket	Purchase, Home
T20	S1	Basket	Purchase	Thank You
T21	S1	Purchase	Thank You	Home
T22	S3	Home	A	A1, A2
T23	S2	Purchase	Thank You	Home

Figure 4: An example of a Web server log of an online store

Timestamp	Session ID	Referrer	Current Page	Links
T1	S1	Home	Home	A, B, P1, Search
T3	S1	Home	A	A1, A2
T6	S1	A	A1	Basket, A
T8	S1	A1	Basket	Purchase, Home
T10	S1	Basket	Home	A, B, P1, Search
T12	S1	Home	B	B1, B2, B3
T13	S1	B	B2	Basket, B
T14	S1	B2	B	B1, B2, B3
T16	S1	B	B3	Basket, B
T19	S1	B3	Basket	Purchase, Home
T20	S1	Basket	Purchase	Thank You
T21	S1	Purchase	Thank You	Home

(a) Session S1 — 501

Timestamp	Session ID	Referrer	Current Page	Links
T2	S2	R2	Home	A, B, P1, Search
T5	S2	Home	Search	
T9	S2	Search	Search Result	A2, B1, B2
T11	S2	Search Result	B1	Basket, B
T15	S2	B1	Basket	Purchase, Home
T17	S2	Basket	Purchase	Thank You
T23	S2	Purchase	Thank You	Home

(b) Session S2 — 502

Timestamp	Session ID	Referrer	Current Page	Links
T4	S3	R3	Home	A, B, P1, Search
T7	S3	Home	P1	Basket
T18	S3	P1	Home	A, B, P1, Search
T22	S3	Home	A	A1, A2

(c) Session S3 — 503

Figure 5: An example of sessions in an online store

604 605 606 607

Product impressions	Clickthroughs	Basket placement	Purchase
T1, P1	T6, A1	T8, A1	T20, A1
T3, A1	T13, B2	T19, B3	T20, B3
T3, A2	T16, B3		
T10, P1			
T12, B1			
T12, B2			
T12, B3			
T14, B1			
T14, B2			
T14, B3			

(a) Micro-conversions of session S1 — 601

Product impressions	Clickthroughs	Basket placement	Purchase
T2, P1	T11, B1	T15, B1	T17, B1
T9, A2			
T9, B1			
T9, B2			

(b) Micro-conversions of session S2 — 602

Product impressions	Clickthroughs	Basket placement	Purchase
T4, P1	T7, P1		
T18, P1			
T22, A1			
T22, A2			

(c) Micro-conversions of session S3 — 603

Figure 6: An example of micro-conversions in an online store

start
652

Input A: {S} where each element Si represents a shopping step
Input B: {R} where each element Ri represents a request in a session

Get a request Ri from {R}

Get a step Si from {S}

Does Ri belong to Si?

Tag Ri as Si

More Si?

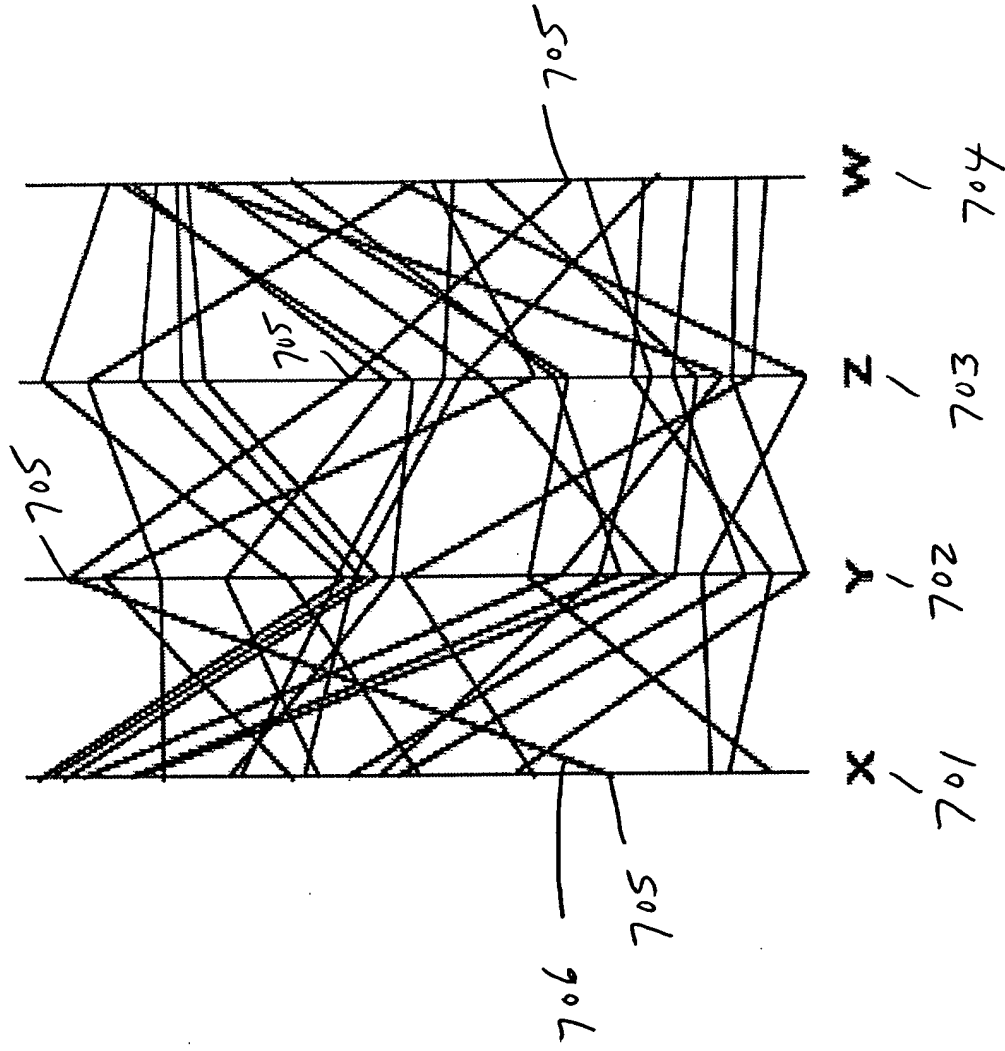
More Ri?

Output: {C} where each element Ci comprises one or more Ri tagged as Si

stop

Figure 6A: A flow chart of a shopping step finder process

700



Prior Art

Figure 7: An example of a traditional parallel coordinate system

800

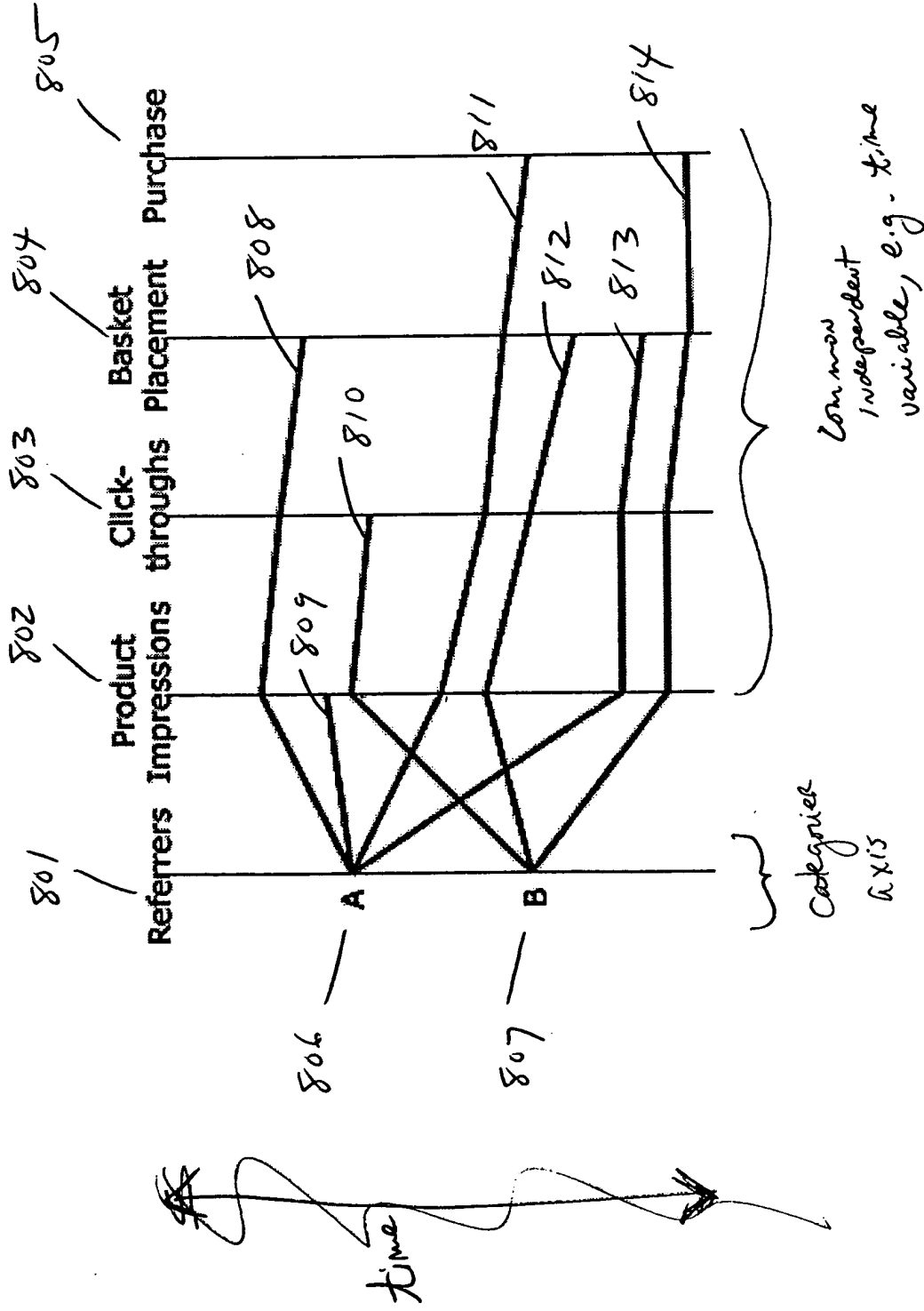


Figure 8: An example of a micro-conversion visualization with a parallel coordinate system

900

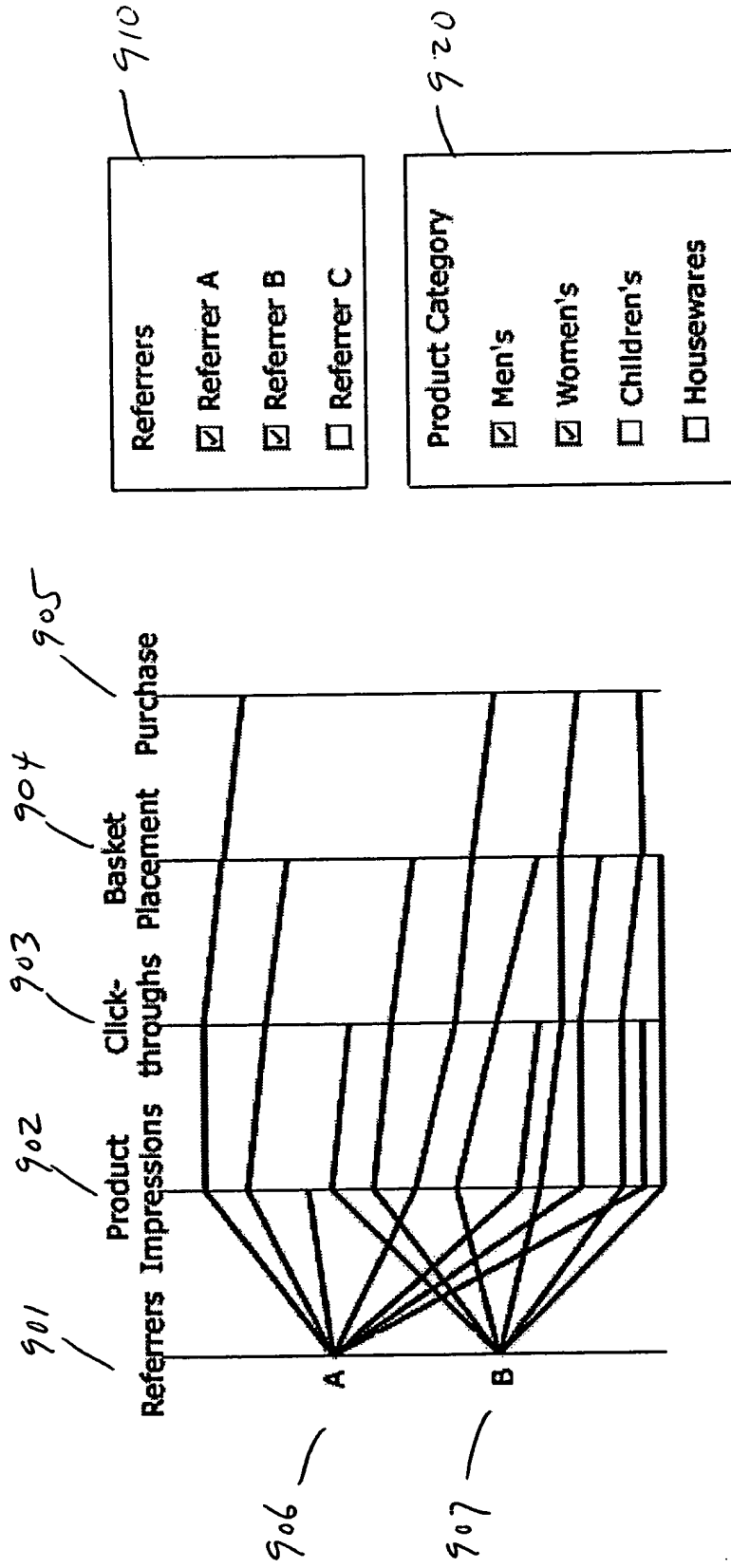


Figure 9: An example of a micro-conversion visualization with filters

1000

00T000" 20245960

Timestamp	Session ID	Store	Referrer	Current Page	Links
T4	S3	ST1	R3	Home	A, B, P1, Search
T7	S3	ST1	Home	P1	Basket
T18	S3	ST1	P1	Home	A, B, P1, Search
T22	S3	ST1	Home	A	A1, A2
T23	S3	ST2	ST1	Home	B, C, D, Search
T24	S3	ST2	Home	Search	
T25	S3	ST2	Search	Search Results	C2, C3, D1
T26	S3	ST2	Search Results	C2	Basket, C
T27	S3	ST2	C2	Search Results	C2, C3, D1
T28	S3	ST2	Search Results	C3	Basket, C
T29	S3	ST3	ST2	Home	A, B, C, D, Search
T30	S3	ST3	Home	Search	
T31	S3	ST3	Search	Search Results	A1, B1, C3, D2
T32	S3	ST3	Search Results	D2	Basket, D
T33	S3	ST3	D2	Basket	Purchase, Home
T34	S3	ST3	Basket	Home	A, B, C, D, Search
T35	S3	ST3	Home	D	D1, D2, D3
T36	S3	ST3	D	D3	Basket, D
T37	S3	ST3	D3	Basket	Purchase, Home
T38	S3	ST3	Basket	Purchase	Thank You
T39	S3	ST3	Purchase	Thank You	Home

Figure 10: An example of a session browsing more than one online stores

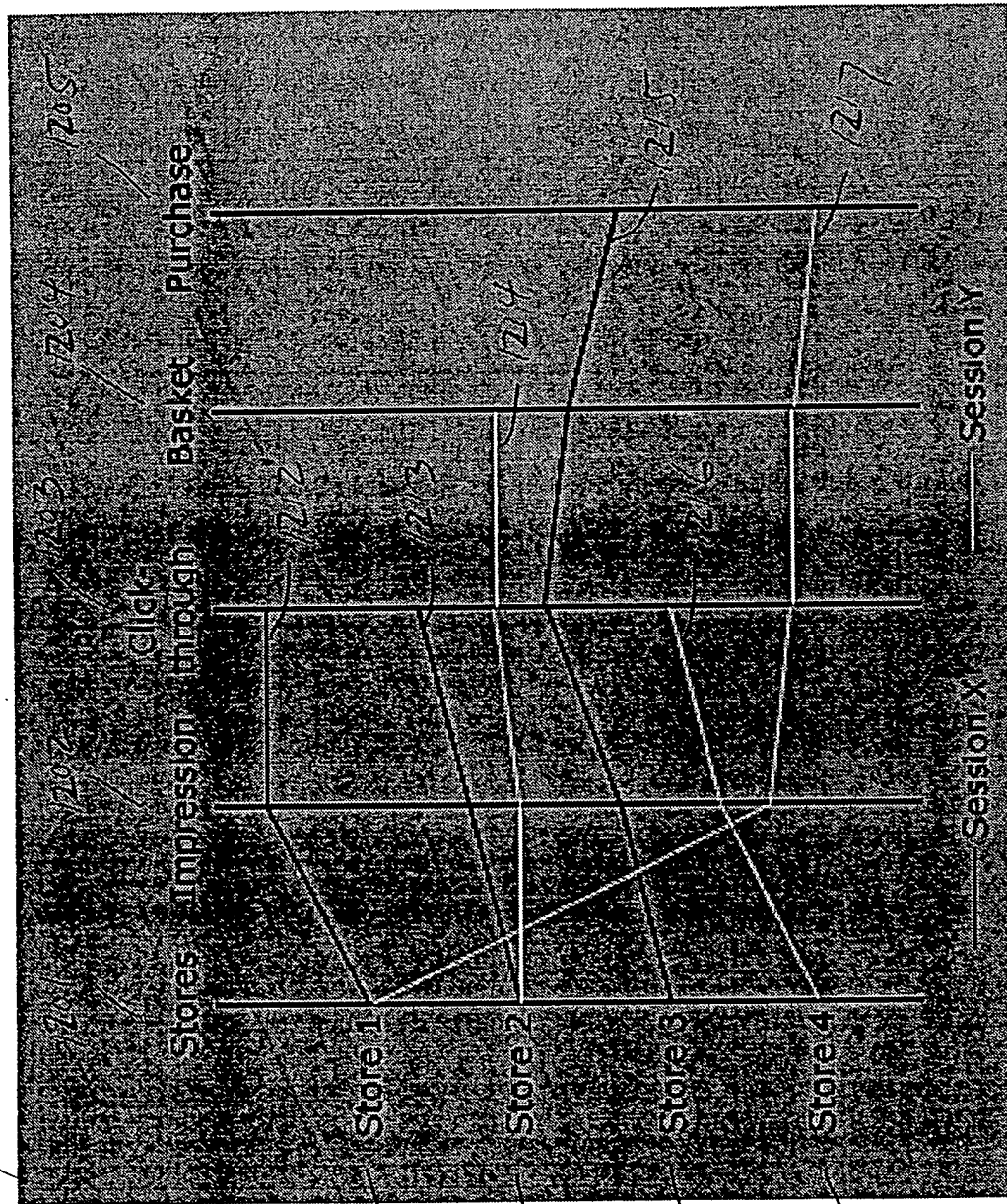
1100

00T060" 20245960

Product impressions	Clickthroughs	Basket placement	Purchase
T4, P1, ST1	T7, P1, ST1	T33, D2, ST3	T38, D2, ST3
T18, P1, ST1	T26, C2, ST2	T37, D3, ST3	T38, D3, ST3
T22, A1, ST1	T28, C3, ST2		
T22, A2, ST1	T32, D2, ST3		
T25, C1, ST2	T36, D3, ST3		
T25, C3, ST2			
T25, D1, ST2			
T27, C2, ST2			
T27, C3, ST2			
T27, D1, ST2			
T31, A1, ST3			
T31, B1, ST3			
T31, C3, ST3			
T31, D2, ST3			
T35, D1, ST3			
T35, D2, ST3			
T35, D3, ST3			

Figure 11: An example of micro-conversions of a session browsing more than one online stores

1200 Category Store



1210
1211
Sub-category
by store session = set of
events

Figure 12: An example of visualizing shopping activities in more than one online stores